

bergs (by airborne or spaceborne imaging radar, by over-the-horizon HF radar, or at nearer range by ground-based, ship-based or rig-based microwave radar), mechanical properties of ice (by *in situ* seismic and acoustic methods), ice thickness (by airborne electromagnetic induction methods and ice-thickness radars), ice concentration (by passive microwave radiometry and imaging radar), ice type (by passive microwave radiometry or imaging radar), and ice dynamics (from time series of airborne or spaceborne imaging radar). All of these techniques are discussed in considerable detail, and a number of practical examples of implementation are given, based on Canadian experience. In addition, the book contains some introductory remarks on the status of remote sensing research in Canada, some concluding remarks on the forthcoming Canadian Radarsat satellite mission and on future research directions, and a superb 70-page review of the physical properties of sea ice, glacier ice and snow.

If the book has a drawback, it is that its title is slightly misleading in implying a comprehensiveness that is not really present. The book essentially treats only the most up-to-date techniques of remote sensing of sea ice and icebergs, and largely ignores (for example) the use of visible and near-infrared imagery which still forms a major component of operational ice mapping. However, this 'missing' information is readily available from other sources, and I certainly expect to be making significant use of this book in future. Anyone interested in sea ice and icebergs and how they are detected, or in the technical aspects of the development of remote sensing systems, will also want to have access to this book.

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ENVIRONMENTAL CHANGE IN DRYLANDS: BIOGEOGRAPHICAL AND GEOMORPHOLOGICAL PERSPECTIVES edited by A. C. Millington and K. Pye, John Wiley and Sons, Chichester, 1994. No. of pages: xv + 456. Price: £65.00. ISBN 0-471-94267-7.

Environmental change in drylands continues to attract broad attention owing to the fact that many of the effects of environmental change are poorly understood, data are scarce and long-term monitoring is rare.

This collection of papers, presented at a symposium on the *Effects of Environmental Change in Drylands* (jointly organized by the Biogeography Research Group and the BGRG and held at the Institute of British Geographers Annual Conference in Swansea, in January 1992), reflects the diversity and complexity of the topic and draws upon work done primarily by geomorphologists and biogeographers.

This admirably produced volume (the ninth in the BGRG Symposia series) contains 23 papers organized loosely into two sections: long-term and medium-term studies, before the last 1000 years, including the late Quaternary (chapters 2 to 11); and short-term studies of the last 1000 years (chapters 12 to 22). These are preceded by an excellent and thorough overview of deserts in a warmer world by Professor Andrew Goudie, and a final editorial chapter reviews research on the effects of environmental change in drylands.

Nash, Thomas and Shaw provide a very useful study concluding that the development of large 'fossil' dryland valley systems (using the valley networks in the Kalahari) during former wetter periods may be an oversimplification. White and Walden demonstrate the potential for using mineral magnetic analysis in establishing relative chronosequences on alluvial fan surfaces in the Tunisian

Southern Atlas. Harvey and Wells, from their study of alluvial fans in the southern Soda Mountains in the Mojave Desert of California, provide yet another piece of evidence for a wetter and colder climate during the late Pleistocene. The papers by Alexander *et al.* and Macklin *et al.* deal with badland slopes and fluvial and lacustrine sediment records from southeast and northeast Spain, respectively.

Metcalfe *et al.* provide an interesting study from palaeolimnological sediments of closed-basin lakes in Central Mexico of the effects of anthropogenic disturbance and climate change, while Lamb *et al.* discuss lacustrine sedimentary processes in high-altitude, semi-arid Lake Isli, in the High Atlas of Morocco. Abrupt Holocene hydro-climatic events from lake basins on the southern and northern margins of the Sahara are analysed by Roberts *et al.* Ballais discusses the causes of desertification and aeolian activity in eastern Algeria, while Yair provides an example of the effects of variations in climate change on environmental processes from various sites in Israel.

There is an interesting group of four papers on anthropogenic and natural processes and their interrelationships in such diverse geographic locales as Libya, the Fertile Crescent, semi-arid Australia and southern France. The use of stochastic methods in modelling dryland ecosystems is outlined by Thornes and Brandt. Hughes provides a study dealing with semi-arid floodplain forests, and Drake and Bryant point out the usefulness of using AVHRR imagery to estimate the flooding ratio of nine Tunisian plays.

The papers by Goosens *et al.* and Dickenson *et al.* deal with the environmental effects of land reclamation in the western Nile Delta region and the Wadi Allgi area, on the eastern side of Lake Nasser in southern Egypt, respectively. Finally, two papers by Mitchell and Fuller and

Scott, on desertification and land degradation in north-central China and north-western India, respectively, round up this volume.

Although somewhat overwhelmed by the sheer range of topics, I enjoyed reading this comprehensive collection of essays and would recommend it to geomorphologists and biogeographers and others with interest

in environmental change in drylands, as well as to university libraries.

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DESERTIFICATION: EXPLODING THE MYTH by David S. G. Thomas and Nicholas J. Middleton, Wiley Chichester, 1994. No. of pages: xiii + 194. Price: £32.00. ISBN 0-471-94815-2.

This is a very timely book on a topic that needed a second evaluation. The book contains a prologue, nine chapters and an epilogue. In the prologue, the authors make it clear that their aim is to elucidate and demystify desertification by tracing the various political, social and scientific studies.

In the prologue, four propositions are outlined: (a) that according to the United Nations, one third of the world is affected by desertification and land degradation; (b) that drylands are fragile ecosystems and thus prone to desertification and degradation; (c) that desertification is the primary cause of human misery in drylands; and (d) that the United Nations is central in understanding and solving global desertification and degradation. The nine chapters following the prologue address the above four issues and a final summary is given.

Chapter two, the history of desertification, provides an excellent overview of the events that led to the convening in Nairobi, Kenya, in 1977 of the *UN Conference on Desertification* and the unveiling of the UNPACD (Plan of Action) to combat desertification and to control it by the year 2000. The narrative in this chapter takes the reader through such watershed events as the 1930s Dust Bowl of the Great Plains in the United States and the Sahelian droughts of the 1970s.

Chapter three examines the role of the United Nations, particularly the United Nations Environmental Programme (UNEP), in shaping desertification into a major world issue and bureaucratizing and eventually creating its own unique framework for understanding and mitigating global land degradation. In chapter four, UNEP's anti-desertification agenda is analysed. It is incredible to realize that the whole agenda was based on poor and sketchy scientific data leading ultimately to the ominous notion of the 'advancing desert'. Small-scale anti-desertification schemes were generally put aside in favour of big programmes, primarily as a means to attract more funding and to advance certain political and social agendas.

Chapter five discusses the primary causes of desertification. What emerges is that people are the primary agents causing desertification, especially when well

established, traditional land-use systems are destroyed or changed in order to participate in the global economy. Chapter six discusses why desertification occurs. The primary candidates include poor understanding of the dryland physical environment, inadequate planning, and the exclusion of the local dryland inhabitants from the decision-making process.

Chapters seven to nine unravel the desertification myth. It is clear that human-induced degradation needs to be separated from natural variations in the biophysical system (climate, soils, vegetation, geomorphology). Future scientific investigations should concentrate on such important issues as the long-term monitoring of dryland environments, and the question of population increase in developing countries and its impact on land degradation. Also, small-scale development projects should be encouraged and implemented owing to the fact that money from large-scale projects is typically spent on covering the expenses of consultants and experts, and that very little money actually permeates to the local community (average cost of a new project in 1989 was around \$400,000!).

In summarizing, the authors look at the evidence presented in the first nine chapters and arrive at the following conclusions: (a) the global extent of desertification seems to be grossly exaggerated and primarily based on marginal scientific data; (b) dryland ecosystems are adapted to environmental stresses and often appear to exhibit good recovery characteristics; (c) desertification and drought have been used as scapegoats to mask more serious causes, including political ineptitudes, and poorly and hastily planned economic systems for short-term fixes to curb social malaise; and (d) the UN created desertification with its institutional myth and bureaucracy and seems intent on maintaining it under its auspices.

This is a controversial book which will probably cause raised eyebrows and make certain people and institutions rather nervous. It is lucid, well written and well organized, with ample documentation, and should make excellent reading for all geoscientists, politicians, economists and others conducting work in the environmental sciences.

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